

**PROFESSIONAL RECORD**  
**CLARK M. MOWER**

**POSITION:** Vice President

**YEARS WITH FIRM:** 10

**DATE OF BIRTH:** November 22, 1946

**PROJECT ASSIGNMENT:** Project Manager, Environmental Specialist, Governmental Approvals

**EXPERIENCE SUMMARY**

Mr. Mower's experience has been in the planning and development of projects needing special consideration in water supply, governmental approvals and environmental concerns. He has worked closely with city, county and state agencies in the approval process of projects designed and engineered under his direction.

Mr. Mower has also worked extensively with water rights where he has analyzed appropriations, use data, supply and distribution systems and prepared for and appeared as a witness in many water rights actions in court cases.

He has been involved in the White River Oil Shale Alternative Water Sources Studies, White River Dam and Hydroelectric Project, Project Manager for the Water Alternatives Study for the Paraho -Ute Project, all of the Bountiful City Power and Light Hydroelectric Projects, Elberta Farms Irrigation Study.

He has been responsible for the preparation of Environmental Impact Statements on numerous hydroelectric and development projects and has coordinated their preparation and approval with the various agencies.

Mr. Mower has served as Project Manager on large development projects in Salt Lake, Weber, Summit, Utah and Wasatch Counties, Utah and other surrounding states.

He is currently serving as Project Manager for the Mayflower Recreational Project, a 2556 unit development in Wasatch and Summit Counties, Utah.

He has worked closely with the Utah Department of Transportation, U.S.D.I., Bureau of Reclamation and all of the major utility companies in planning for and evaluating this Development's impact on the surrounding community and governmental agencies.

He has also been involved in Master Plan and environmental preparation and review of the Spring Creek, Blue Ridge, Silver Summit and Bertagnole developments, all of which lie in the immediate proximity of the proposed project.

## PROFESSIONAL RECORD

### GALEN W. WILLIAMS

**POSITION:** Project Geologist/Laboratory Manager

**YEARS WITH FIRM:** 9-1/2

**DATE OF BIRTH:** January 8, 1951

**EDUCATION:** M.S. Applied Geomorphology - University of Utah (1981)  
B.S. Physical Geography/Geomorphology - University of Utah (1975)

**REGISTRATION:** CPGS 6705

(UDOT certified in AASHTO Materials Testing Procedures, 1985)

**AFFILIATIONS:** Utah Geological Association, Geological Society of America, Association of Engineering Geologists, International Association of Engineering Geologists, American Institute of Professional Geologists. Adjunct Associate Professor, Department of Geography, University of Utah 1986-87 academic year

## EXPERIENCE SUMMARY

### Project Manager/Geologist

1986	Browning Ferris Industries Monitoring Well Program at an active landfill.
1986	Kennecott Copper, UCD, Tailings/Tailing Sludge Mixture, included laboratory analysis and a correlation of samples using a scanning electron microscope.
1986	Kennecott Copper, UCD, Surface Water Program, includes, field exploration and placement of exploration and monitoring wells.
1986	Kennecott Copper, UCD, New Truck Shop Foundation Investigation.
1986	Wailua and Hanalei Hydroelectric Projects, Kauai, Hawaii, geologic field investigation and engineering geology assessment.
1986	South Davis City, siting and production monitoring of commercial culinary water well, 16" diameter, includes screen selection, development and pump test.
1986	South Jordan City, siting and sizing of culinary water wells.
1986	Water diversion study, Sulfurdale Mine, Beaver County, Utah
1986	Davis Blvd, field exploration, rotary drilling operations
1985	Ephraim Sity, hydroelectric project, mapping landslides and other geologic hazards.
1985	Lapoint Dam, Uinta Basin, Utah, conducted geologic exploration, design, and coordinated construction on this 80' high 1200' long earthen dam.

1984-1985 Millcreek Hydroelectric Project, Reedsport Oregon, mapping and geologic EIS, Loon Lake Slide.  
1985 Utah Groundwater Technical Advisory Group Kennecott Copper Corp, - South Jordan City Representative  
1984 Bedrock Exploration Groundwater Study, Crescent Junction, Utah  
1983-1984 Utah State Arboretum Embankment Reservoir, Salt Lake

#### Geologist

1985-1986 Little Dell Dam, field investigation and design report  
1983 Foundation analysis Echo Dam Hydroelectric Project completed for FERC license.  
1983-1984 White River Shale Oil, Parahoe and Tosco, oil shale water resource study  
1981-1984 Numerous hydroelectric projects, geologic reconnaissance and license level reports, Utah, Idaho, Oregon and Washington  
1979-1982 White River Dam, field investigation and design report  
1978-1980 Utah International, Bald Knoll; investigation and development.

#### Laboratory/Field Testing and Project Inspection

1981-1984 Triad Center  
1979-1984 Salt Lake International Center  
1979-1980 Anaconda Haul Road  
1979 Carr Fork Access Road  
1978-1979 Kents Lake Dam  
1977-1978 Great Salt Lake Culinary Waterline

### EXPERIENCE RECORD

#### Bingham Engineering (Utah)

Project Geologist (1980 to date). Mr. Williams is responsible for all geologic/geotechnical operations. He directs, reviews or conducts geologic and geotechnical investigations ranging from feasibility stages through exploration design and construction. Most recently he has been involved in siting, logging and development of municipal water wells and some monitoring wells. He is also manager of the materials testing laboratory and coordinates all operations and training.

Staff Geologist/Laboratory Technician/Inspector (1977-1980). Mr. Williams worked as a laboratory and field technician under the direction of the chief geotechnical engineer and carried out geologic mapping, reconnaissance and rotary drilling operations. He also served as inspector on various construction projects ranging from earth dams to pipeline and roadway projects. On these projects he conducted all materials testing and nuclear density testing activities.

## CONTINUING EDUCATION

1980-1984 Numerous seminars on groundwater investigation, engineering geology and materials testing procedures.

## PUBLICATIONS

1983 Energy Resources and Geologic Overview of the Uinta Basin (road log, reference data and bibliography). Editor and co-writer, Utah Geological Association 1983 Field Trip Guide, Utah Geological Association, publication 11, 1983.

1983 Rivers of Energy, Utilizing the Uinta Basin's Water Resources, in: Geology and Energy Resources, Uinta Basin of Utah, Utah Geological Association, publication 12, M.D. Picard, Editor, 1985

## PROFESSIONAL RECORD

BRENT S. BINGHAM  
Registered Professional Engineer

Nationality: Citizen of U.S.A.  
Date of Birth: December 27, 1945

Position: Consultant

Specialties: Project Management \* Water Resources Engineering \* Dam Design \* Damsite and Reservoir Investigations \* Seepage and Stability Analyses \* Geotechnical Engineering

### KEY QUALIFICATIONS

#### Project Manager/Project Engineer:

1986	Golder Dam (Arizona)
1986	Chevron Groundwater Monitoring (Utah)
1986	Twin Lakes Dams (Wyoming)
1985-1987	Newfoundland Dike, West Desert Pumping Project (Utah)
1985	Little Dell Dam (Utah)
1984	Avon Reservoir Storage Project (Utah)
1984	Emigration Canyon Landslide Stabilization (Utah)
1983	Mill Creek Reservoir Study (Utah)
1983	East Promontory Reservoir/West Bay Studies (Utah)
1980-1982	White River Dam Investigation and Design (Utah)
1979-1981	Homestake Wastewater Reservoir Design and Construction (Colorado)
1981	M-X MOB Flood and Utilities Studies (Utah, Nevada, and New Mexico)
1973-1986	Utah International Groundwater Studies and Test Pumping (Utah)
1979-1980	Homestake Groundwater Development (Colorado)
1975-1982	Salt Lake International Center Geotechnical Investigations and Infrastructure Design and Construction (Utah)
1980	Bullock Dam Investigation and Preliminary Design (Utah)
1979	Kents Lake Dam Rehabilitation (Utah)
1979	Carr Fork Access Road (Utah)
1978	South Shore Pipeline (Utah)
1973-1976	Warner Valley Water Project Preliminary Design (Utah)
1973	Inundation Studies (California)

#### Consultant:

1986	ISM Project (Pakistan)
1986	Kennecott Surface Water Management (Utah)
1986	Tongue River Dam Risk Assessment (Montana)
1984	Schoens Dam (Arizona)
1984	North Fork Siphon - Central Utah Project
1984	Barton Creek Debris Basin (Utah)
1983	Gunlock Dam Stability (Utah)
1983	Piute Dam Stability (Utah)

1982 O & M and Rehabilitation Studies of NIA Irrigation Systems (Philippines)  
1982-1986 Smith-Morehouse Dam (Utah)  
1981 Woodruff Narrows Dam (Wyoming)  
1978 South Willow Damsite (Utah)

Geotechnical Engineer:

1981 Witten Lake-Lake Creek Pipeline/Penstock (Utah)  
1981 Northpoint Canal Relocation and Lining (Utah)  
1980 Piute Dam Spillway Rehabilitation (Utah)  
1978 Sevier Bridge Reservoir Spillway Rehabilitation (Utah)  
1979 Kents Lake Dam Rehabilitation (Utah)  
1976-1977 Kessler Canyon Flood Control Dam, (Utah)  
1976-1977 Smelter Canyon Flood Control Dam, (Utah)  
1972-1973 Six Tailings Retention Dams (Utah, Arizona, and New Mexico)  
1982-1973 Calveras Dam Dynamic Analysis and Rehabilitation (California)  
1972 Buffalo Creek Dam Failure Analysis (West Virginia)  
1972 Live Oak Dam (California)

Resident Engineer/Inspector:

1971 YT Dam Construction (Colorado)  
1970 Gunlock Dam Construction (Utah)  
1969 Woodruff Creek Dam Construction (Utah)  
1964 Settlement Canyon Dam Construction (Utah)

**EXPERIENCE**

**PRC Engineering, Inc.**

Manager-Utah Operations (1983-to date, Utah). Mr. Bingham is responsible for management of PRC projects in the Utah area. His involvement includes coordination, supervision, review and technical contribution to planning, field work, design, and construction management.

Irrigation and Drainage Consultant (1982-1983, Philippines). Mr. Bingham conducted operation, maintenance, rehabilitation and drainage studies and evaluated canals, pipelines, flumes, turnouts, pumping plants, diversion dams, and operation and maintenance practices associated with nine irrigation systems.

**Bingham Engineering**

Vice President and Chief Engineer (1973-1982, Utah). Mr. Bingham was responsible for management and technical responsibilities for water resource, geotechnical, and land development projects. Projects included dams and reservoirs, groundwater investigation and development, hydrologic studies, canals and pipelines, soils and

foundation investigations, industrial and agricultural land development, road and highway projects, and structural design. Mr. Bingham has directed studies for the rehabilitation of existing dams, including raising the embankment, and rehabilitating or replacing the spillway and outlet structures. He also directed several under water inspections and maintenance projects for dam facilities using scuba equipment.

#### W.A. Wahler and Associates

Staff Engineer (1972-1973, California). Mr. Bingham participated in all phases of soils and foundation investigations, analyses, report preparation. Work also included dam design and analysis, hydrology and supervision of field work.

#### EDUCATION

B.S., Civil Engineering, Utah State University, 1972. M.B.A., University of Utah, 1986. Post Graduate studies in geotechnical engineering, San Jose State University. Graduate Management courses, water law and engineering geology, University of Utah. Other short courses on embankment dams and soils, University of California, Berkeley, and University of Missouri, Rolla.

#### REGISTRATION

Registered professional engineer in Utah, California, Wyoming and Idaho.

## PROFESSIONAL RECORD

**STANLEY L. PLAISIER**                      Nationality:      Citizen of U.S.A.  
Registered Professional Engineer      Date of Birth:      December 12, 1951

Position: Senior Geotechnical Engineer

Specialties: Water Retention and Tailings Dams \* Geotechnical Engineering \*  
Stability Analyses \* Hazardous Waste Studies and Design

### KEY QUALIFICATIONS

#### Project Engineer:

1986	Groundwater Monitoring Well Installation (Utah)
1985	Little Dell Dam (Utah)
1985	Newfoundland Dike (Utah)
1983-1985	West Desert Pumping Project (Utah)
1984	Great Salt Lake Diking Feasibility Study (Utah)
1984	Super Conducting Super Collider (Utah)
1984	Rock Creek Project Tailings Dam (Montana)
1984	EPA-RCRA Part B Permit Application (Idaho)
1984	EPA-RCRA Part B Permit Application (Wyoming)
1984	Plans and Specifications for a Closure Cell (Tennessee)
1984	EPA-RCRA Closure/Post-Closure Plans (Utah)
1983	Kennecott UCD Tailings Pond (Utah)
1982-1983	Troy Project Tailings Dam (Montana)
1982	Whitewater Dam - Chino Mines Division (New Mexico)
1981	Wendall Dam (Wyoming)
1981	Great Salt Lake Offshore Oil Drilling (Utah)
1981-1985	Numerous soil and foundation investigations (Utah and Wyoming)

#### Geotechnical Engineer:

1986	Structural Behavior of Bureau of Reclamation Dam
1985	Boundary Dam (Washington)
1985	Sheridan Area Water Supply Investigations (Wyoming)
1984-1985	Lapoint Dam (Utah)
1980-1981	Antelope Island Conveyor System (Utah)
1981	Witts Lake Dam Rehabilitation (Utah)
1980	Puite Dam Rehabilitation (Utah)
1980-1981	White River Dam (Utah)
1980	Bullock Dam (Utah)
1979	Kents Lake Dam Rehabilitation (Utah)
1979-1981	Homestake Wastewater Reservoir (Colorado)
1978	Carr Fork Access Road (Utah)
1978-1981	Salt Lake International Center Geotechnical Investigations (Utah)

1980-1981      Alton Coal Fields Groundwater Study (Utah)  
1976-1977      Rock Mechanics Studies for Longwall Coal Demonstration  
                  Project (Illinois)

## EXPERIENCE RECORD

### PRC Engineering, Inc.

Project Manager/Geotechnical Engineer (1985 to date). Serves as Project Manager and as Lead Geotechnical Engineer for water resources and hazardous waste projects executed by PRC Engineering. Responsibilities include: establishment of field investigation programs and laboratory testing programs; analysis of results of field and laboratory programs to establish design parameters; analyzing the static and dynamic stability of embankments and performing seepage analyses, design of embankment dams including determination of side slopes, internal zoning, foundation treatment and instrumentation networks; writing technical specifications; preparation of construction drawings; and construction inspection. Typical water resources projects include the following; design of the Little Dell flood control dam consisting of a 210-foot high embankment dam and appurtenant structures; design and preparation of plans and specifications for a 7.5-mile long embankment dike (Newfoundland Dike) on a soft foundation to contain the rising Great Salt Lake; and design and supervision of the installation of piezometers at the existing Boundary Dam. Hazardous waste projects have included the installation and monitoring of a groundwater monitoring well system; and evaluating a former landfill to determine the potential for the presence of hazardous waste.

### Dames & Moore

Project Engineer (1981 to 1985). Responsible for geotechnical investigations, designs and construction inspection for water retention and tailings dams, hazardous waste disposal projects, evaporation ponds and foundations for structures and buildings. Projects included over 12 dams and numerous foundation projects for significant structures and buildings. This included analysis of existing conditions through interpretation of instrumentation data, seepage conditions and stability analyses; materials investigations of the existing structure and potential borrow areas; and analysis and design of methods to raise the existing structure. Hazardous waste projects included the preparation of closure and Part B application for RCRA facilities. This included the investigation, analysis and design of waste and groundwater containment systems. Several existing surface impoundments were retrofitted with synthetic double liner systems.

Assistant Engineer/Staff Engineer (1976-1978). Participated in soils and foundation investigations and rock mechanics studies in the Central and Eastern United States. Conducted soils and foundation investigations for single and multi-story buildings and other structures which utilized both pile and spread foundations. These studies included performing detailed field and laboratory investigations, design and report preparation and construction monitoring. Also participated in a rock mechanics instrumentation study and an engineering geology investigation for an underground mine.

## Bingham Engineering

Staff Engineer/Project Engineer (1978 to 1981). Participated in, and/or directed, geotechnical studies for water resource, geotechnical and land development projects. Projects included dams and reservoirs, soils and foundation investigations, road construction projects, groundwater studies and industrial land development. Also responsible for the soils laboratory operation at the firm in addition to duties as Project Engineer.

## EDUCATION

M.S., Geotechnical Engineering, University of Michigan, 1976.  
B.S., Civil Engineering, University of Michigan, 1975.

## PROFESSIONAL RECORD JUDD LAWRENCE

**POSITION:** Hydraulic Engineer  
**YEARS WITH FIRM:** 6  
**DATE OF BIRTH:** November 27, 1957  
**EDUCATION:** B.S. Utah State University, 1981  
**REGISTRATION:** P E Utah

### EXPERIENCE SUMMARY

#### Project Engineer

1986 Kennecott - Surface Water Management Plan  
1985 to date South Jordan City  
1984 Little Wood Dam Hydroelectric Plant  
1984 South Jordan City Engineer  
1984 Dewatering System for 35 Story Building  
1984 Phase I Site Development Triad Center  
1983 Mayflower Hydrology  
1983 White River Oil Shale Corp. Water Supply Alternative Study

#### Staff Engineer

1983 Low Line Hydroelectric Project  
1982 Paraho Oil Shale Company Water Supply Alternative Study  
1981 TOSCO Water Supply Alternative Study  
1981 M-X Site Hydrology Evaluation

#### Field Engineer

1981-82 Numerous projects at Salt Lake International Center  
1980 Homestake Mining Company Pitch Project Wastewater Storage Dam  
1979 Anaconda Haul Road

### EXPERIENCE RECORD

#### Bingham Engineering

Project Engineer (1980 to Present). Mr. Lawrence has been responsible for the design, specification, shop inspection and field supervision on various hydroelectric projects. He has varied experience in hydrological and water supply studies. His field experience is quite diverse including pipeline, pump stations, dams, roads and site development.

## PROFESSIONAL RECORD

### RICHARD L. MURPHY

**POSITION:** Geologist - Bingham Engineering

**YEARS WITH FIRM:** 3

**DATE OF BIRTH:** May 9, 1960

**EDUCATION:** B.S. Geology, University of Utah 1983

### EXPERIENCE SUMMARY

#### Geologist

1986 Field Geologist Kennecott Surface Water Management Study. Involved in all phases of exploration and materials testing. Duties included: Geologic mapping of study sites, field logging of drill holes and test pits, packer testing of drill holes, installation of monitor wells and production wells, monitoring of 48 hour pump test, and laboratory testing of soil samples.

1986 Field Geologist Kennecott Truck Shop Foundation Report. Field logging of exploration drill holes.

1986 Kennecott Tailings/Tailings Sludge Laboratory analysis of Tailings.

1986 Surface Water Management Plan at Sulphurdale. Surveying and evaluation and supervision of installation of surface water diversion system.

1986 Field Geologist. Browning Ferris Ind. Logging, installation, monitoring and sampling of groundwater monitor wells for a county landfill.

1986 Geologist, South Davis Co. Water Well. Logging of cuttings and monitoring of drilling for the 500 foot municipal water well.

### EXPERIENCE RECORD

1984 Mr. Murphy has performed geologic field investigations and logging on geotechnical projects ranging from earth dams to commercial water wells. This has involved extensive logging operations on rotary drilling and testpits. He has been involved in the mapping of project sites and the preparation of environmental assessments. He is experienced in all phases of materials testing and is certified by UDOT and AASHTO materials testing procedures.

**NAME AND TITLE**

Robert W. Knox  
Chief of Surveyors

**EDUCATION**

Associate of Science Degree, Lane Community College,  
Eugene, Oregon 1972

**REGISTRATION**

Licensed Professional Land Surveyor in Oregon #1905,  
Licensed Professional Land Surveyor in Utah #7192

**EXPERIENCE**

1984-Present

Chief Surveyor Bingham Engineering. Manage survey  
department of company. Surveys for land development,  
water resources, property descriptions.

March 1976-1984

Plants and Associates

Head of subdivision construction and field survey  
supervisor.

Boundary survey work: subdivision layout, computation  
and preparation of survey and topographic maps, as well  
as the preparation of legal descriptions.

Cadastral survey: Field crew chief, corner search, blasing  
and corner monumentation. Section breakdown and all  
surveying computations.

March 1972-March 1976

Plants and Associates

Party Chief, boundary survey work, subdivision layout,  
street and sewer staking and office computation of all the  
above. Survey, subdivision and topography mapping.  
Right-of-way and utility easement preparation.

**NAME AND TITLE**

Mark N. Gregory  
Chief of Party

**EDUCATION**

Bachelor of Science Degree, Utah State University, 1978

**YEARS EXPERIENCE**

1979 to present  
Party Chief for Bingham Engineering

**RELATED PROJECT EXPERIENCE**

Survey work: Staking for roads, buildings, pipeline, parking lots, topographic mapping, field design, slope staking and all related computations. He has been involved in many projects for Bingham Engineering including the following related projects: Westpointe, East Canyon, Triad Center, Salt Lake International Center and Pine Shadows.

Crew Chief: For all construction surveying of 2100 South freeway, 3200 West to 5600 West.

## **PROFESSIONAL RECORD**

**CHRIS D. HANSEN**

**Position:** Geologist/Hydrogeologist

**Specialties:** Geologic and Hydrogeologic Investigations \* Materials Testing

## **EXPERIENCE RECORD**

Mr. Hansen has 3 years experience in detailed geologic surface and subsurface mapping. He also has participated in and conducted hydrogeologic investigations for the White River Dam, Bullock Dam and the proposed Alton Coal project. He has experience in laboratory testing of concrete, soils and asphalt materials for road, buildings and dam sites.

## **EDUCATION**

M.S. Geology, Stratigraphy and Structure, Brigham Young University, 1987  
B.S. Geology, Brigham Young University, 1981

## PROFESSIONAL RECORD

### RONALD D. ANDRUS

Position: Geological Engineer  
Date of Birth: December 8, 1958

Specialties: Geologic Investigations \* Geotechnical and Material Testing \* Construction Inspection

## EXPERIENCE SUMMARY

### Engineer/Geologist

1986	Sheridan Water Supply Investigations (Wyoming)
1986	Newfoundland Dike (Utah)
1985-1986	Whiskey Springs Liquefaction Study (Idaho)
1984	Upper Bear River Dam Feasibility Study (Utah)
1984	Fish Creek Dam/Tunnel Feasibility Study (Wyoming)

## EXPERIENCE RECORD

### PRC Engineering, Inc.

Geological Engineer (1986 to date) Mr. Andrus is responsible for conducting surface and subsurface geologic and geotechnical field investigations, geologic mapping, engineering evaluations and report writing.

### Rollins, Brown, and Gunnel, Inc.

Assistant Engineer/Geologist (summer 1984) Mr. Andrus was responsible for the geologic and geotechnical field investigations on two proposed dam sites. He also performed pile load tests and computer seepage and slope stability analyses.

### All Mineral Corporation

Field Assistant (summer 1981). Responsible for the collection of soil samples for two geotechnical surveys in Idaho and Nevada.

## EDUCATION

M.S., Geotechnical Engineering, Brigham Young University  
B.S., Engineering Geology/Mathematics, Brigham Young University

## **PROFESSIONAL RECORD**

**LARRY F. MILNER**

**Position:** Assistant Engineer/Technician

**Specialties:** Materials Testing \* Laboratory Testing

## **EXPERIENCE RECORD**

Mr. Milner has performed laboratory testing for dam and reservoir sites, roadways and proposed building developments. He also has been involved in surveying and the construction inspection of earthwork projects.

## **EDUCATION**

**B.S., Civil Engineering, University of Utah, March 1987 (pending)**

## WILLIAM R. HIGHLAND

**Position:** Consultant  
**Education:** B.S. Geology, minor in Civil Engineering - with honors, 1973,  
University of Illinois  
M.S. Hydrogeology - 1975, University of Minnesota  
PhD Course Work, Hydrogeology - 1976-77 University of Illinois  
**Registration:** P.E., Utah, Colorado, Minnesota, New Mexico

### EXPERIENCE RECORD

#### Highland Associates

Principal (1984 to date, Utah, Colorado). Since establishing Highland Associates, Mr Highland has been responsible for conducting activities such as:

- o design of a groundwater cut-off well and collection system
- o ground water monitoring system design at hazardous waste sites
- o ground water contamination assessments at hazardous waste sites including geophysical surveys, pumping tests, water quality analyses, and ground water flow and contaminant transport modeling
- o design of hazardous waste site closure plans
- o technical and economic feasibility evaluations of closure and remedial action alternatives including cut-off walls, recovery wells, drains, liners and covers
- o alternate concentration limit petition documents (RCRA ground water monitoring variance petition)

#### Dames & Moore

##### Senior Hydrologist (1980 - 1984, Salt Lake City & Perth, Australia)

- o devised and directed geochemical laboratory investigations of clay liner performance in contact with acidic and caustic process fluids
- o site investigations including geophysical logging, pump tests, packer tests, borrow material investigations and water quality testing
- o design of mine dewatering systems
- o development and application of ground water contaminant transport models
- o economic and technical feasibility studies for locating waste disposal sites

#### Barr Engineering Company

##### Project Hydrologist/Geotechnical Engineer (1975 - 1980, Minneapolis)

- o resident engineer, tailing dam construction
- o dam foundation and barrow area investigations
- o dam design including slope stability analyses, hydrologic and flood routing analyses, design of underdrains and design of well depressurization systems

## **WILLIAM R. HIGHLAND, page 2**

- o ground water contamination assessments
- o design of large municipal water supply wells
- o economic and technical feasibility evaluations of alternate water supply schemes
- o ground water flow and contaminant transport modeling
- o HUD flood plane delineation studies
- o designed and inspected a grouting program for a tailings pond decant line

### **EXPERIENCE SUMMARY:**

#### **Lead Ground Water Hydrologist**

1984 - 1986	Kennecott Bingham Canyon Groundwater Barrier (Utah) Utah International Alton Coal Project (Utah) Amoco Hazardous Waste Facilities (Salt Lake City) Chevron Refinery (Salt Lake City) Husky Refinery (Salt Lake City) Husky Refinery (Wyoming)
1982 - 1984	Western Mining Corp. Baldivis Tailing Pond (W. Australia) Leigh Creek Coal Mine (S. Australia) Semirara Coal Mine (Philippines) ARCO Gelliondale Coal Property (Vic., Australia) Alcoa Alumina Tailings Pond (W. Australia) State Electricity Commission Ash Disposal Pit (W. Australia)

#### **Senior Hydrologist**

1980 - 1982	F.A.P. Uranium Tailing Disposal and Evaporation Ponds (Wy.) Anaconda Bluewater Mill Uranium Tailing Disposal (New Mexico) Exxon Highlands Uranium Mine (Wyoming) Amoco Mandan Refinery (North Dakota) Kennebott McGill Tailing (Nevada)
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#### **Project Hydrologist/Geotechnical Engineer**

1975 - 1980	Northern States Power SHERCO Ash Disposal Pond (Minnesota) Hibbing Taconite Tailing Dam (Minnesota) AMAX Lead Tailing Dam (Missouri) Eveleth Taconite Tailing Dam (Minnesota) Reilly Tar and Chemical Creosote Plant (Minnesota) Reserve Mining Tailings Facility (Minnesota) City of Bloomington Water Supply Well (Minnesota) City of Moorehead Water Supply System (Minnesota)
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### **CONTINUING EDUCATION**

Structural Engineering I & II, University of Minnesota 1978  
Advances in Computer Graphics for CAD and CADD, U. of Minnesota 1979  
Design and Construction of Tailing Dams, Colorado State University 1979